# PLYMOUTH COUNTY CONTRIBUTORY RETIREMENT SYSTEM

Actuarial Valuation Report

January 1, 2006

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# **Report Summary:**

<u>hlights</u>	<u>January 1, 2004</u>	<u>January 1, 2006</u>
Contributions		
Funding Schedule FY 2007	\$34,085,524	\$34,085,524
Funding Schedule FY 2008	35,303,997	38,854,868
Funded Ratios		
GAS No. 25	64.8%	60.8%
<u>Participants</u>		
Actives	6,838	7,058
Retirees and Beneficiaries	2,569	2,736
Vested	0	1
Inactives	1,688	1,717
Disabled	<u>337</u>	<u>330</u>
Total	11,432	11,842
<u>Payroll</u>		
Payroll of Active Members	\$208,312,002	\$226,262,731
Average Payroll	30,464	32,058
Normal Cost		
Employer	9,940,502	8,552,189
Employee	16,765,042	18,137,253
Administrative Expenses	675,000	960,000
Total	27,380,544	27,649,442
Actuarial Accrued Liabilities		
Actives	438,280,048	488,070,681
Retirees, Beneficiaries, Disabilities and Inactives	363,878,405	430,781,026
Total	802,158,453	918,851,707
Actuarial Value of Assets	520,104,805	558,533,863
<u>Unfunded Actuarial Accrued Liabilities</u>	\$282,053,648	\$360,317,844

# **Introduction**

This report presents the findings of an actuarial valuation as of January 1, 2006, of the Plymouth County Retirement System.

The actuarial valuation is based on:

- Provisions Chapter 32 of the Massachusetts General Laws, "M.G.L", as of January 1, 2006.
- Employee data provided by the Retirement Board
- Asset information reported to the Public Employee Retirement Administration Commission by the Plymouth County Retirement System
- Actuarial assumptions approved by the Retirement Board

The valuation and appropriation forecast are prepared in accordance with Chapter 32 of the M.G.L. as of January 1, 2006.

The valuation and forecast do not account for:

- Any subsequent changes in the law
- Chapter 32 of the M.G.L., Section 3(8)(c) transfers between systems
- State-mandated benefits
- Cost-of-living increases granted to retired members between 1982 and 1997. The
  cost of these benefits has been assumed by the State under Proposition Two and
  One-Half.

## **Actuarial Experience**

In performing the actuarial valuation, various assumptions are made regarding such factors as mortality, retirement, disability, and withdrawal rates as well as both payroll, salary increases, and investment returns. A comparison of the current valuation and the prior valuation is made to determine how closely actual experience corresponded to anticipated occurrences. This analysis of the system provides insight into the overall quality of the actuarial assumptions and helps explain any change in the annual appropriation.

During the two years since the last valuation was completed, the total unfunded actuarial accrued liability increased by 27.75% to \$360,317,844. Roughly 80.0% of this loss is the result of unfavorable asset returns during 2004 and 2005. Asset losses amounted to \$29,363,681 and \$22,672,354 for 2004 and 2005, respectively. The annual rates of return for 2004 and 2005, based on the actuarial value of assets, were 2.85% and 4.26%, respectively, which were both less than our assumed investment return of 8.5%.

Another component of the unfavorable experience was a liability loss from mortality, more disability retirements than expected and new entrants to the system. The liability loss was partially offset by a gain due to salary increases less than the assumption.

## **Actuarial Costs and Liabilities:**

#### **Normal Costs**

The normal cost is the sum of the individual normal costs determined for each member as if the assumptions underlying the cost determinations had been exactly realized. An individual normal cost represents that part of the cost of a member's future benefits which are assigned to the current year as if the costs are to remain level as a percentage of the member's pay. Benefits payable under all circumstances (i.e., retirement, death, disability, and terminations) are included in this calculation. Anticipated employee contributions to be made during the year are subtracted from the total normal cost to determine employer normal cost. The total normal cost is divided by total payroll to determine the normal cost as a percent of pay. The normal cost is shown in Table I.

Tabl	le I	
	<u>January 1, 2004</u>	January 1, 2006
Superannuation	\$17,839,804	\$17,835,522
Termination	3,410,061	3,220,765
Death	1,313,134	1,509,873
Disability	4,142,545	4,123,282
Administrative Expenses	<u>675,000</u>	960,000
Total Normal Cost	27,380,544	27,649,442
% of Pay	13.1%	12.2%
Employee Contributions	16,765,042	18,137,253
% of Pay	8.0%	8.0%
Employer Normal Cost	\$10,615,502	\$9,512,189
% of Pay	5.1%	4.2%

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# **Present Value of Actuarial Accrued Liabilities**

The actuarial accrued liabilities (AAL) represents today's value of all benefits earned by the actives and inactives. The AAL can be compared to the assets to determine the funded status of the Plan. The value of these earned benefits is shown in Table II below.

Table II		
	January 1, 2004	January 1, 2006
Actives		
Superannuations	\$413,220,088	\$423,003,409
Termination	(10,527,808)	14,720,962
Death	10,593,516	15,895,703
Disability	24,994,252	34,450,607
Retirees and Inactives		
Retirees and Beneficiaries	285,833,381	347,805,743
Vested	0	35,133
Terminated (Refund)	6,270,237	6,985,808
Disabled	71,774,787	75,954,342
Total	\$802,158,453	\$918,851,707

# **Present Value of Future Benefits**

The present value of future benefits represents today's value of all benefits earned by the inactive participants as well as all benefits earned and expected to be earned in the coming years by the active participants. The difference between the present value of future benefits and the present value of actuarial accrued liabilities is the value of benefits to be earned in the coming years. The value of the total expected benefits is shown in Table III.

Table I	II	
	<u>January 1, 2004</u>	January 1, 2006
Actives		
Superannuation	\$569,176,495	\$568,946,173
Termination	19,118,679	27,090,956
Death	21,715,095	27,227,711
Disability	59,669,665	71,174,983
Retirees and Inactives		
Retirees and Beneficiaries	285,833,381	347,805,743
Vested	0	35,133
Terminated (Refund)	6,270,237	6,985,808
Disabled	71,774,787	75,954,342
Total	\$1,033,558,339	\$1,125,220,849

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# **Funded Status and Appropriations:**

# **Market Value of Plan Assets**

The trust fund composition on a market value basis is shown in Table IV.

Ta	able IV	
	<u>January 1, 2004</u>	<u>January 1, 2006</u>
Cash equivalents	\$5,814,454	\$12,144,150
Short term investments	3,717,030	5,094,858
Fixed income securities	124,558,124	132,514,671
Equities	252,199,825	352,713,827
International	38,453,878	0
Real Estate	34,344,025	56,842,382
Venture Capital	0	0
Other	10,288,856	7,970,376
Accounts receivable	12,092,232	2,906,834
Accounts payable	(2,792,578)	(2,814,173)
Accrued income	<u>277,426</u>	<u>242,276</u>
Total Market Value	\$478,953,272	\$567,615,201
Total Actuarial Value	\$520,104,805	\$558,533,863

#### **Actuarial Value of Assets**

The actuarial value of assets is determined by projecting the actuarial value of assets as of the beginning of the prior plan year with the assumed rate of return during that year (8.5%) and accounting for deposits and disbursements with interest at the assumed rate of return. An adjustment is then applied to recognize the difference between the actual investment return and expected return over a five year period. This preliminary actuarial value is not allowed to differ from the market value of assets by more than 10%. The calculation of the actuarial value of assets as of January 1, 2006 is presented in Table V.

#### Table V

		January 1, 2006
(1)	Market value at January, 1, 2005	\$525,752,112
(2)	2005 Contributions	56,331,521
(3)	2005 Benefit payments	(55,470,795)
(4)	Net interest adjustment at 8.5% on (1), (2), and (3) to December 31, 2005	44,725,510
(5)	Expected market value on January, 1, 2006	\$571,338,349
	(1) + (2) + (3) + (4)	
(6)	Actual market value on January, 1, 2006	\$567,615,201
(7)	2005 Loss	3,723,148
(8)	80% of 2005 loss	2,978,518
(9)	2004 Gain	(6,190,924)
(10)	60% of 2004 gain	(3,714,554)
(11)	2003 Gain	(66,195,031)
(12)	40% of 2003 gain	(26,478,012)
(13)	2002 Loss	90,663,551
(14)	20% of 2003 loss	18,132,710
(15)	Actuarial value on January, 1, 2006	
	(6) + (8) + (10) + (12) + (14) but not less than 90% or more than 110% of (6)	\$558,533,863
(16)	Ratio of actuarial value to market value	98.40%
(17)	2004 Market Value Return on Assets	9.8%
(18)	2004 Actuarial Value Return on Assets	2.9%
(19)	2005 Market Value Return on Assets	7.8%
(20)	2005 Actuarial Value Return on Assets	4.3%

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## **Unfunded Actuarial Accrued Liabilities**

Under the Entry Age Normal Actuarial Cost Method, the Actuarial Accrued Liability represents what the accumulated assets would have been as of the valuation date if:

- current plan provisions and assumptions had always been in effect,
- experience conformed exactly to assumptions, and
- the normal cost had been contributed each year since inception.

The actuarial value of the Fund's assets as of the end of the prior year are subtracted from the Actuarial Accrued Liability (AAL) to determine the Unfunded Actuarial Accrued Liability (UAAL) as of the valuation date. Over time, annual pension contributions will accumulate Plan assets equal to the AAL, and the UAAL will be eliminated. Thereafter, annual contributions equal to the normal cost will keep the Plan's assets and liabilities in balance. The UAAL is developed in Table VI.

Table	e VI	
	<u>January 1, 2004</u>	<u>January 1, 2006</u>
Actuarial Accrued Liability	\$802,158,453	\$918,851,707
Actuarial Assets	<u>520,104,805</u>	558,533,863
Unfunded Actuarial Accrued Liability	\$282,053,648	\$360,317,844
Funded Status	64.8%	60.8%

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## **Appropriations**

The pension appropriation for the upcoming fiscal years have been calculated in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws. These amounts were calculated to comply with the June 30, 2028, full funding mandate for all accrued liabilities. The pension appropriation is the sum of the:

- Employer normal cost,
- Increasing amortization of the unfunded actuarial accrued liability by June 30, 2026 \$353,036,902 over 20 years with 4.5% increasing payments
- Level amortization of the 1992 Early Retirement Incentive by June 30, 2009 \$215,766 over 3 years
- Level amortization of the 2002 Early Retirement Incentive June 30, 2019 \$4,641,548 over 13 years
- Level amortization of the 2003 Early Retirement Incentive June 30, 2020 \$2,423,628 over 14 years
- Interest adjustment for payments deposited semiannually.

The pension appropriation is shown in Table VII.

Table VII		
	January 1, 2004	<u>January 1, 2006</u>
Normal cost	\$10,615,501	\$9,512,189
Amortization payment of the accrued liability	17,961,084	24,639,276
Amortization payment of 1992 ERI liability	77,863	77,863
Amortization payment of 2002 ERI liability	556,228	556,228
Amortization payment of 2003 ERI liability	<u>0</u>	<u>278,868</u>
Total cost	\$29,210,676	\$35,064,424
% of Pay	14.0%	15.5%
Fiscal 2007 cost	\$34,085,524	\$34,085,524
Fiscal 2008 cost	\$35,303,997	\$38,854,868

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#### **Appropriation Forecast**

The following exhibit forecasts employer and employee contributions over the next 32 years under the adopted funding schedule.

Note that the forecast is based upon an "open group" method. This method assumes that sufficient employees will be hired each year to keep the number constant. The total payroll of the system is expected to increase 4.5% per year. The employee contribution rate is expected to increase to 10.5% by 2028 as members contributing base percentages 5%, 7%, and 8% are replaced by new members, whose base contribution is 9%. Payments are assumed to be spread over the fiscal year.

The employer total cost is expected to increase during the next 20 years until the unfunded liabilities are completely paid off, at which time only the normal cost will remain. The total cost represents on average about 16.1% of payroll, decreasing to 13.4% by the time the unfunded liabilities are fully paid off, leaving only a normal cost of 1.9% thereafter. The decrease in the cost as a percentage of payroll is a result of the increase in member deductions.

# **Appropriation Forecast**

Fiscal			Employer	Amortization	Employer	Employer	
Year		Employee	Normal Cost	Payments	Total Cost	Total Cost	Funded
Ending	<u>Payroll*</u>	<b>Contribution</b>	with Interest	with Interest	with Interest	% of Payroll	Ratio %**
2007	\$226,262,731	\$18,137,253	\$10,110,263	\$23,975,261	\$34,085,524	15.1	60.8
2008	\$236,444,554	\$19,233,108	\$10,267,962	\$28,586,906	\$38,854,868	16.4	62.5
2009	\$247,084,559	\$20,390,862	\$10,419,380	\$29,829,650	\$40,249,030	16.3	64.3
2010	\$258,203,364	\$21,613,867	\$10,563,633	\$31,045,560	\$41,609,193	16.1	66.0
2011	\$269,822,515	\$22,905,650	\$10,699,770	\$32,402,669	\$43,102,439	16.0	67.8
2012	\$281,964,529	\$24,269,926	\$10,826,768	\$33,820,846	\$44,647,614	15.8	69.5
2013	\$294,652,932	\$25,710,603	\$10,943,529	\$35,302,842	\$46,246,371	15.7	71.3
2014	\$307,912,314	\$27,231,795	\$11,048,873	\$36,851,528	\$47,900,401	15.6	73.1
2015	\$321,768,368	\$28,837,829	\$11,141,539	\$38,469,905	\$49,611,444	15.4	74.9
2016	\$336,247,945	\$30,533,262	\$11,220,170	\$40,161,109	\$51,381,279	15.3	76.8
2017	\$351,379,103	\$32,322,888	\$11,283,316	\$41,928,416	\$53,211,732	15.1	78.7
2018	\$367,191,162	\$34,211,750	\$11,329,425	\$43,775,253	\$55,104,678	15.0	80.6
2019	\$383,714,764	\$36,205,156	\$11,356,834	\$45,705,197	\$57,062,031	14.9	82.6
2020	\$400,981,929	\$38,308,690	\$11,363,769	\$47,130,789	\$58,494,558	14.6	84.6
2021	\$419,026,116	\$40,528,226	\$11,348,330	\$48,941,934	\$60,290,264	14.4	86.6
2022	\$437,882,291	\$42,869,945	\$11,308,490	\$51,144,321	\$62,452,811	14.3	88.7
2023	\$457,586,994	\$45,340,350	\$11,242,084	\$53,445,816	\$64,687,900	14.1	90.8
2024	\$478,178,409	\$47,946,279	\$11,146,801	\$55,850,878	\$66,997,679	14.0	93.0
2025	\$499,696,437	\$50,694,928	\$11,020,178	\$58,364,167	\$69,384,345	13.9	95.3
2026	\$522,182,777	\$53,593,863	\$10,859,587	\$60,439,303	\$71,298,890	13.7	97.6
2027	\$545,681,002	\$56,651,046	\$10,662,226	\$0	\$10,662,226	2.0	100.0
2028	\$570,236,647	\$59,874,848	\$10,425,113	\$0	\$10,425,113	1.8	100.0
2029	\$595,897,296	\$62,569,216	\$10,894,243	\$0	\$10,894,243	1.8	100.0
2030	\$622,712,674	\$65,384,831	\$11,384,484	\$0	\$11,384,484	1.8	100.0
2031	\$650,734,744	\$68,327,148	\$11,896,786	\$0	\$11,896,786	1.8	100.0
2032	\$680,017,808	\$71,401,870	\$12,432,141	\$0	\$12,432,141	1.8	100.0
2033	\$710,618,609	\$74,614,954	\$12,991,587	\$0	\$12,991,587	1.8	100.0
2034	\$742,596,447	\$77,972,627	\$13,576,209	\$0	\$13,576,209	1.8	100.0
2035	\$776,013,287	\$81,481,395	\$14,187,138	\$0	\$14,187,138	1.8	100.0
2036	\$810,933,885	\$85,148,058	\$14,825,559	\$0	\$14,825,559	1.8	100.0
2037	\$847,425,910	\$88,979,721	\$15,492,710	\$0	\$15,492,710	1.8	100.0
2038	\$885,560,076	\$92,983,808	\$16,189,881	\$0	\$16,189,881	1.8	100.0
	* C-111						

<sup>\*</sup> Calendar basis

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#### GASB Statements No. 25 and No. 27

Effective for periods beginning after June 15, 1997, the Governmental Accounting Standards Board (GASB) requires the disclosure of pension related liabilities for public employer financial statements in accordance with Statements 25 and 27. These statements, which replace GASB Statement No. 5, must be adhered to by any public employee retirement system that follows Generally Accepted Accounting Principles (GAAP).

These disclosures are intended to establish a reporting framework that distinguishes between:

- current financial information about plan assets and financial activities,
- actuarially determined information from a long-term perspective,
- the funded status of the plan, and
- progress being made in accumulating sufficient assets to pay benefits when due.

Footnote disclosures required by GASB Statement No. 25 and 27 include a description of the plan, a summary of significant accounting policies, and information about contributions, legally required reserves, and investment concentrations. As a result of the oversight of the Public Employees Retirement Administration Commission (PERAC) and the conversion of unpaid contributions to pension related debt, the Net Pension Obligation (NPO) as required by Statement No. 27 will effectively always be equal to \$0. The required disclosure information is shown in Table VIII.

Table VIII				
		January 1, 2004	<u>January 1, 2006</u>	
(1)	Actuarial Accrued Liability	\$802,158,453	\$918,851,707	
(2)	Actuarial Value of Assets	<u>520,104,805</u>	558,533,863	
(3)	Unfunded Actuarial Accrued Liability	282,053,648	360,317,844	
(4)	Funded Ratio (2)/(1)	64.8%	60.8%	
(5)	Covered Payroll	\$208,312,002	\$226,262,731	
(6)	UAAL as a percentage of payroll: (3)/(5)	135.4%	159.2%	
(7)	Annual Required Contribution (ARC)	\$25,695,625	\$34,085,524	
(8)	Net Pension Obligation	\$0	\$0	

8.5%

5.0%

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Investment Return:

Rate of Salary Increase:

# PERAC Annual Statement APPENDIX PAGE 3 ACTUARIAL VALUATION AND ASSUMPTIONS

The most recent actuarial valuation of the System was prepared by Buck Consultants as of January 1, 2006.

The normal cost for employees on that date was:	\$18,137,253	8.0% of pay
The normal cost for the employer was:	8,552,189	3.8% of pay
The actuarial liability for active members was:		\$488,070,681
The actuarial liability for retired members was:		430,781,026
Total actuarial accrued liability:		918,851,707
System assets as of that date:		558,533,863
Unfunded actuarial accrued liability:		\$360,317,844
The ratio of system's assets to total actuarial liability was		60.8%
The principal actuarial assumptions used in the valuation are as follows:		
• •		

#### SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio	Covered Payroll	UAAL as a percent of Covered Payroll
	(a)	(b)	(b-a)	(a/b)	(c)	(b-a)/c
01/01/06	\$558,533,863	\$918,851,707	\$360,317,844	60.8%	\$226,262,731	159.2%
01/01/04	520,104,805	802,158,453	282,053,648	64.8%	208,312,002	135.4%
01/01/02	466,325,660	733,198,204	266,872,544	63.6%	205,039,686	130.2%
01/01/00	450,210,619	611,204,058	160,993,439	73.7%	178,010,731	90.4%
01/01/98	316,253,566	492,303,777	176,050,211	64.2%	148,264,981	118.7%
01/01/96	222,822,638	359,461,980	136,639,342	62.0%	136,768,169	99.9%

Attach Copy of Current Approved Funding Schedule

# **EXHIBITS**

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#### Age/Service Distribution with Salary as of January 1, 2006

Attained Age	Average Salary <5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
< 20	2	0	0	0	0	0	0	0	0	2
	19,678	0	0	0	0	0	0	0	0	19,678
20-24	98	0	0	0	0	0	0	0	0	98
	19,818	0	0	0	0	0	0	0	0	19,818
25-29	482	53	2	0	0	0	0	0	0	537
	21,176	30,193	47,711	0	0	0	0	0	0	22,165
30-34	198	161	27	0	0	0	0	0	0	386
	29,463	45,708	42,145	0	0	0	0	0	0	37,126
35-39	266	191	141	50	6	0	0	0	0	654
	25,160	42,607	50,007	50,221	60,375	0	0	0	0	37,851
40-44	414	233	150	136	37	2	0	0	0	972
	20,432	32,388	45,311	55,972	57,816	68,503	0	0	0	33,632
45-49	462	360	158	148	86	31	0	0	0	1,245
	19,553	24,103	35,176	47,084	56,433	60,962	0	0	0	29,703
50-54	320	301	218	168	82	83	44	3	0	1,219
	21,663	23,126	31,964	38,420	49,491	62,083	63,293	92,162	0	32,476
55-59	182	194	178	170	99	71	82	27	1	1,004
	23,742	26,978	28,715	33,736	40,313	51,853	58,647	56,243	63,134	34,327
60-64	99	118	89	131	78	54	34	16	7	626
	20,876	27,427	29,203	33,884	34,627	37,188	56,853	62,322	66,725	32,663
65-69	30	44	39	27	28	29	14	8	2	221
	21,307	24,816	28,894	33,902	34,936	37,365	52,212	33,535	37,996	31,269
70+	17	21	12	13	10	7	10	3	1	94
	12,186	17,391	21,285	24,027	29,653	18,441	48,908	39,144	40,645	23,542
Total Employees		1,676	1,014	843	426	277	184	57	11	7,058
Average Salary	21,935	29,958	36,193	41,457	45,492	50,838	58,408	55,753	58,804	32,058

Retiree Distribution as of January 1, 2006

	Numbe	er of Employe	ees	Tota	l Payments	
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	2	0	2	14,883	0	14,883
40-44	5	3	8	89,849	25,916	115,764
45-49	9	6	15	175,946	60,712	236,658
50-54	19	15	34	557,940	147,545	705,485
55-59	113	89	202	3,672,631	928,144	4,600,775
60-64	215	219	434	6,123,616	2,543,520	8,667,136
65-69	207	271	478	4,871,413	3,480,380	8,351,793
70-74	196	273	469	3,441,562	2,940,747	6,382,309
75-79	178	242	420	2,638,306	2,116,089	4,754,396
80-84	135	230	365	1,756,792	1,776,022	3,532,814
85-89	67	123	190	560,434	844,400	1,404,834
90-94	37	49	86	319,524	357,814	677,338
95-99	23	11	33	137,791	69,041	206,832
tal	1,206	1,530	2,736	24,360,688	15,290,329	39,651,017
verage (Age/Payment)	73.2	73.2	73.2	20,200	9,987	14,487
equency Percent	44.1	55.9	100.0	61.4	38.6	100.0

Disabled Retiree Distribution as of January 1, 2006

	Numbe	er of Employe	ees	Total	Payments	
Attained Age	Male	Female	Total	Male	Female	Total
< 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	3	0	3	85,080	0	85,080
40-44	12	5	17	352,844	137,801	490,645
45-49	17	2	19	528,868	46,904	575,772
50-54	35	6	41	885,747	77,913	963,660
55-59	61	9	70	1,561,151	147,884	1,709,035
60-64	45	7	52	1,172,539	160,204	1,332,743
65-69	55	3	58	1,317,903	36,554	1,354,457
70-74	31	1	32	710,276	4,566	714,842
75-79	20	2	22	376,596	28,141	404,738
80-84	11	0	11	200,945	0	200,945
85-89	5	0	5	76,636	0	76,636
90-94	0	0	0	0	0	0
95-99	0	0	0	0	0	0
	295	35	330	7,268,585	639,966	7,908,551
rage (Age/Payment)	62.5	57.5	62.0	24,639	18,285	23,965
uency Percent	89.4	10.6	100.0	91.9	8.1	100.0

# **EXHIBIT 4 - CASHFLOW FORECAST:**

The following is a 30 year forecast of benefit payments net of state reimbursable COLA payments, Contribution Income and Investment Returns.

Plan Year	Benefit	Employee	Employer	Investment	Net change in
Ending	Payments	Contributions	Contributions	Returns	plan assets
2006	\$54,308,613	\$18,137,253	\$36,524,272	\$47,235,024	\$47,587,936
2007	\$57,678,959	19,233,108	37,833,748	\$51,240,473	50,628,370
2008	\$61,097,113	20,390,862	39,189,041	\$55,507,429	53,990,219
2009	\$64,532,256	21,613,867	40,510,519	\$60,061,368	57,653,498
2010	\$68,226,901	22,905,650	41,961,901	\$64,924,834	61,565,484
2011	\$72,073,336	24,269,926	43,463,636	\$70,120,350	65,780,575
2012	\$76,138,044	25,710,603	45,017,314	\$75,671,203	70,261,076
2013	\$80,424,422	27,231,795	46,624,573	\$81,600,115	75,032,061
2014	\$84,605,792	28,837,829	48,287,084	\$87,945,699	80,464,820
2015	\$88,968,177	30,533,262	50,006,570	\$94,752,630	86,324,285
2016	\$93,595,974	32,322,888	51,784,788	\$102,054,020	92,565,722
2017	\$98,457,195	34,211,750	53,623,545	\$109,884,033	99,262,133
2018	\$103,570,900	36,205,156	55,524,687	\$118,280,938	106,439,881
2019	\$108,950,202	38,308,690	56,910,720	\$127,261,386	113,530,594
2020	\$114,608,896	40,528,226	58,651,873	\$136,853,980	121,425,182
2021	\$120,561,494	42,869,945	60,751,694	\$147,126,958	130,187,103
2022	\$126,823,260	45,340,350	62,921,729	\$158,141,783	139,580,602
2023	\$133,410,251	47,946,279	65,164,044	\$169,951,963	149,652,035
2024	\$140,339,361	50,694,928	67,480,753	\$182,614,933	160,451,253
2025	\$147,628,356	53,593,863	69,874,007	\$196,192,357	172,031,871
2026	\$155,295,930	56,651,046	10,449,146	\$208,173,471	119,977,733
2027	\$163,361,746	59,874,848	10,216,771	\$218,187,078	124,916,952
2028	\$171,846,486	62,569,216	10,676,525	\$228,581,805	129,981,060
2029	\$180,771,910	65,384,831	11,156,969	\$239,394,485	135,164,375
2030	\$190,160,906	68,327,148	11,659,033	\$250,634,562	140,459,837
2031	\$200,037,551	71,401,870	12,183,689	\$262,310,841	145,858,849
2032	\$210,427,172	74,614,954	12,731,955	\$274,431,356	151,351,093
2033	\$221,356,413	77,972,627	13,304,893	\$287,003,224	156,924,330
2034	\$232,853,302	81,481,395	13,903,613	\$300,032,476	162,564,182
2035	\$240,668,703	85,148,058	14,529,276	\$313,702,007	172,710,638

amounts in thousands

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# EXHIBIT 5 – SUMMARY OF PLAN PROVISIONS:

This summary is prepared in accordance with Chapter 32 as of January 1, 2006, and does not take into account any subsequent changes.

#### 1. Administration

Each of the 107 contributory retirement systems for public employees of the Commonwealth of Massachusetts are guided by the applicable provisions of Chapter 32 of the Massachusetts General Laws and other applicable statutes. Although these boards operate semi-independently, there is a uniform set of rules governing benefits, eligibility, contributions, financing, and accounting.

#### 2. Participation

Participation is mandatory for all full-time employees whose employment commences prior to age 65. Eligibility with respect to part-time, professional, temporary, or intermittent employment is governed by the local board. Membership is optional for certain elected officials, State officials appointed by the Governor, and certain hospital interns.

There are four classes of membership as follows:

- (i) Group 1: Most general employees in State and local government
- (ii) Group 2: Certain specified hazardous duty positions
- (iii) Group 3: State police officers and inspectors
- (iv) Group 4: Local police officers, firefighters, and designated employees of the municipal light department.

For members in more than one group, participation will be proportional.

#### 3. Salary

Salary is defined as gross regular compensation. Salary <u>does not</u> include bonuses, overtime, severance pay, unused sick leave credit, or other similar compensation.

#### 4. Member Contributions

Member contributions vary depending upon date hired as follows:

Data of Him	Member Contribution Pata
Date of Hire	Contribution Rate
Prior to 1975	5.0% of Salary
1975 to 1983	7.0% of Salary
1984 to 1996	8.0% of Salary
1996 and Later plus	9.0% of Salary
1979 and Later	2.0% of Salary in excess of \$30,000

#### 5. Average Salary

Average salary is used to determine a participant's benefit. It is defined as the average salary during the three consecutive-year period that produces the highest average. (Alternatively, if a greater amount results, it is the average rate of salary earned during the period or periods, whether or not consecutive, that constitutes the last three years preceding retirement.)

#### 6. <u>Creditable Service</u>

In general, creditable service is awarded during the period in which a member contributes to the retirement system. Word.doc

# 7. Service Retirement

#### a. <u>Eligibility</u>:

For an employee to be eligible for service retirement (also referred to as superannuation), one of the following conditions must be met:

- (i) completion of 20 years of service
- (ii) for an employee hired prior to January 1, 1978, attainment of age 55 as an active member
- (iii) for an employee hired on or after January 1, 1978, attainment of age 55 as an active member and completion of ten years of service

#### b. Benefit Amount:

The retirement allowance is determined as a product of the participant's Benefit Rate times Average Salary times Creditable Service, where Benefit Rate is determined from the following table:

Age at	Perce	Percentage of Average Salary				
Retirement	Group 1	Group 2	Group 4			
65 or Over	.025	.025	.025			
64	.024	.025	.025			
63	.023	.025	.025			
62	.022	.025	.025			
61	.021	.025	.025			
60	.020	.025	.025			
59	.019	.024	.025			
58	.018	.023	.025			
57	.017	.022	.025			
56	.016	.021	.025			
30	.010	.021	.023			
55	.015	.020	.025			
54	.014	.014	.024			
53	.013	.013	.023			
52	.012	.012	.022			
51	.011	.011	.021			
50	.010	.010	.020			
49	.009	.009	.019			
48	.008	.008	.018			
47	.007	.007	.017			
46	.006	.006	.016			
15	005	005	015			
45	.005	.005	.015			
44	.004	.004	.004			
43	.003	.003	.003			
42	.002	.002	.002			
41	.001	.001	.001			

In addition, for veterans (all groups) there is an additional benefit of \$15 per year for each year of service, up to a maximum of 20 years of service.

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#### 8. <u>Deferred Vested Retirement</u>

#### a. Eligibility:

A participant who has completed ten or more years of creditable service is eligible for a deferred vested retirement benefit. If termination is involuntary, the participant is vested after six years.

#### b. Benefit Amount:

The participant's accrued benefit is payable commencing at age 55, or may be deferred until later at the employee's option.

#### c. Refund of Contributions:

In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.

#### 9. Accidental Disability

#### a. Eligibility:

Participants are eligible for an accidental disability benefit, regardless of service or age, if they become permanently and totally incapacitated for further duty as a result of personal injury sustained while in the performance of duties.

#### b. Benefit Amount:

The accidental disability amount is 72% of annual salary plus \$450 per year for each child plus an additional annuity based upon accumulated Member Contributions with credited interest.

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#### 10. Ordinary Disability

#### a. Eligibility:

An ordinary disability occurs when a member becomes permanently and totally disabled due to sickness or injury that is not job related. In order to be eligible for an ordinary disability benefit, a member must have ten years of service (and be less than age 55).

#### b. Benefit Amount:

The ordinary disability amount is equal to the accrued retirement benefit as if the member were age 55. If the member was a veteran, the benefit is 50% of the member's final rate of Salary during the preceding 12 months, plus an annuity based upon accumulated Member Contributions plus credited interest. If the participant is over age 55, he will receive not less than the superannuation allowance to which he is entitled.

#### 11. Survivor Benefits

#### a. Occupational Death:

The survivors of a member who dies due to an occupational injury will be entitled to a lump sum return of contributions plus a pension benefit equal to 72% of the participant's annual Salary.

#### b. <u>Non-Occupational Death</u>:

Upon the death of a member other than due to an occupational injury, the designated beneficiary will be entitled to a retirement benefit as if Option C had been elected with a minimum of \$250 per month to the surviving spouse, plus \$120 for the first child, plus \$90 for each additional child. If no beneficiary is designated and if the employee worked two years, and is married at least one year, the spouse may elect benefits. If there is no designated beneficiary or surviving spouse, then member contributions are returned. If there are dependent children but no surviving spouse, they may elect minimum survivor benefits of \$250 per month plus \$120 for the first child and \$90 for each additional child.

#### c. <u>Refund of Contributions</u>:

Upon the death of a member not entitled to survivor benefits, the beneficiary is entitled to a refund of all member contributions with interest.

#### 12. <u>Cost-of-Living Increases</u>

In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a cost-of-living adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees, and beneficiaries who have been receiving benefits payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the State and are not the liability of the Retirement System.

#### 13. Postretirement Death Benefits

Any benefits following the death of a member after retirement are based upon the form of benefit the participant elected at the time of retirement. There are three available forms as follows:

- (i) Option A Life annuity
- (ii) Option B Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member
- (iii) Option C Life annuity with 66-2/3% of benefit continued after death of member to designated joint annuitant

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# EXHIBIT 6 – ACTUARIAL METHODS AND ASSUMPTIONS:

The actuarial cost method, factors, and assumptions used in determining cost estimates are presented below.

#### 1. Member Data

The member data used in the determination of cost estimates consist of pertinent information with respect to the active, inactive, retired, and disabled members of the employer as supplied by the employer to the actuary.

#### 2. <u>Valuation Date</u>

January 1, 2006.

#### 3. Actuarial Cost Method

The costs of the Plan have been determined in accordance with the individual entry age normal actuarial cost method.

#### 4. Rate of Investment Return

It is assumed that the assets of the fund will accumulate at a compound annual rate of 8.5% per annum.

#### 5. Salary Scale

The assumed annual rates for salary increases including longevity are illustrated by the following rates:

<u>Year</u>	<u>Rate</u>
2006	3.5%
2007	3.5%
2008	4.0%
2009	4.0%
2010	4.5%
2011	4.5%
2012+	5.0%

#### 6. Cost-of-Living Increases

Cost-of-living increases have been assumed to be 3.0% of the lesser of the pension amount and \$12,000 per year.

## 7. <u>Value of Investments</u>

Assets held by the fund are valued at market value as reported by the Public Employees' Retirement Administration Commission (PERAC). The actuarial value of assets is determined using a five-year smoothing of unrealized gains and losses.

#### 8. Annual Rate of Withdrawal Prior to Retirement

Based on an analysis of experience, the assumed annual rates of withdrawal may best be illustrated by the following rates at the following ages:

Service	General Employees	Police and Fire Employees	Jail Employees
0	0.1500	0.0150	0.4500
10	0.0540	0.0150	0.1620
20	0.0200	0.0000	0.0600
30	0.0000	0.0000	0.0000

#### 9. Annual Rate of Mortality

It is assumed that both preretirement and postretirement mortality are represented by the RP-2000 Mortality Table for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members.

# 10. Service Retirement

Based on an analysis of experience, the assumed annual retirement rates are illustrated at the following ages:

	Male	Female	Male and Female
	General	General	<b>Police and Fire</b>
<u>Age</u>	<b>Employees</b>	<b>Employees</b>	<b>Employees</b>
50	0.0100	0.0150	0.02000
51	0.0100	0.0150	0.02000
52	0.0100	0.0200	0.02000
53	0.0100	0.0250	0.05000
54	0.0200	0.0250	0.07500
55	0.0200	0.0550	0.15000
56	0.0250	0.0650	0.10000
57	0.0250	0.0650	0.10000
58	0.0500	0.0650	0.10000
59	0.0650	0.0650	0.15000
60	0.1200	0.0500	0.20000
61	0.2000	0.1300	0.20000
62	0.3000	0.1500	0.25000
63	0.2500	0.1250	0.25000
64	0.2200	0.1800	0.30000
65	0.4000	0.1500	1.00000
66	0.2500	0.2000	1.00000
67	0.2500	0.2000	1.00000
68	0.3000	0.2500	1.00000
69	0.3000	0.2000	1.00000
70	1.0000	1.0000	1.00000

#### 11. Annual Rate of Disability Prior to Retirement

Based on an analysis of experience, the assumed annual rates of disability may best be illustrated by the following probabilities at the following ages:

Attained <u>Age</u>	General <u>Employees</u>	Police and Fire Employees
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125

In addition, it is assumed for the general employees that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).

#### 12. Family Composition

It is assumed that 80% of all members will be survived by a spouse and that females (males) are three years younger (older) than members.

#### 13. Administrative Expenses

The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for fiscal year 2006 is \$960,000 and is anticipated to increase at 4.5% per year.

# **EXHIBIT 7 – GLOSSARY OF TERMS:**

This glossary summarizes the technical terms contained in this report.

#### 1. Actuarial Accrued Liability

That portion of the Actuarial Present Value of plan benefits that is not provided for by future employer Normal Costs or employee contributions.

#### 2. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting the Retirement System such as:

- Rates of investment returns
- Increases in a member's salary
- Inflation
- The probability of mortality, turnover, disablement
- Retirement at each age and other relevant items

#### 3. Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of pension plan benefits between Normal Cost and Actuarial Accrued Liability.

#### 4. Actuarial Present Value

The single sum amount required at the valuation date that is required to provide for anticipated future events based upon the terms of the plan and the Actuarial Assumptions.

#### 5. Forecast

A projection of future benefit payments or contribution requirements based upon the terms of the plan, the current asset amounts, the Actuarial Assumptions, and additional assumptions as to the replacement of terminating employees with new employees.

#### 6. Normal Cost

That portion of the Actuarial Present Value of future benefits that is assigned to the current year.

#### 7. <u>Unfunded Actuarial Accrued Liability</u>

That portion of the Actuarial Accrued Liability that is not provided for by current actuarial value of assets.

#### 8. Valuation Method

The method used to divide the cost of future benefits among the Actuarial Accrued Liability, the current year's Normal Costs, and future years' Normal Costs. The resulting current funding requirement is then determined as the current year's Normal Cost plus the payment necessary to amortize the Unfunded Actuarial Liability.

#### 9. Vested Liability

That portion of the Actuarial Present Value of Accrued Benefits that a member would be entitled to if the member terminated employment with the employer as of the valuation date.

# **CERTIFICATION:**

This report fairly represents the actuarial position of the Plymouth County Retirement System as of January 1, 2006, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience.

Buck Consultants, LLC

D '1777 C1 ACA MAAA

Daniel W. Sherman, ASA, MAAA Enrolled Actuary No. 05-4086

July 2006

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# **BREAKOUTS**